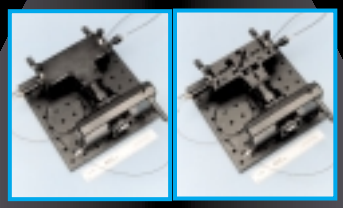
Microtechnology Research and Bioengineering Instrumentation Group

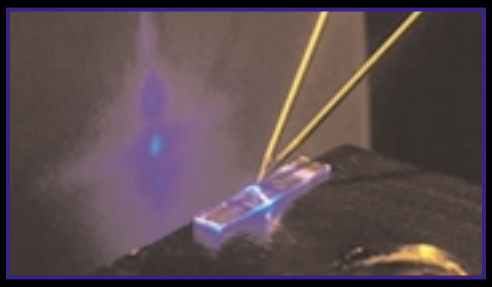
The members of the Microtechnology Research and Bioengineering Instrumentation Group represent a diverse skill set vital to the success of many programmatic efforts. The group is the primary interface between Mechanical Engineering and the Center of Microtechnology and the counter-terrorism group in NAI. In addition, we support a wide variety of activities in the Environmental Protection Department (EPD) and the Medical Technologies Program (MTP). The members combine years of experience in instrument design utilizing state-of-the-art microfabrication and optical detection techniques. We are in a unique position to provide the engineering concepts and designs for the next generation of compact chemical and biological sensors.

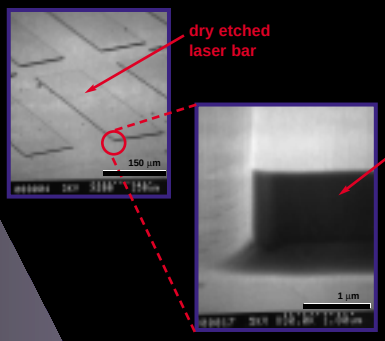
The portable vapor Sniffer is a fiberoptic chemical-sensor-based instrument, field deployable for detecting the presence of land mines.

NTED provides engineering support to the Low Defect Deposition Facility in generating mask blanks for extreme ultraviolet lithography (EUVL) which reflect at 13 nm.



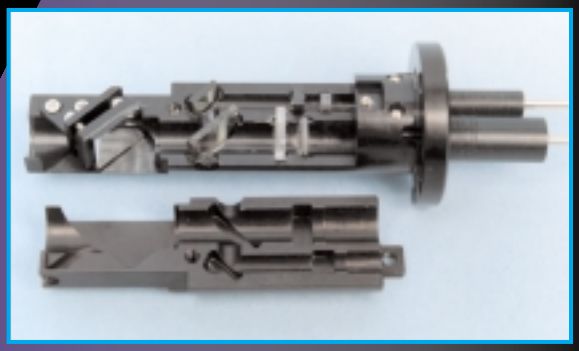
Fluorimeter: (left) with lid and (right) without lid. Miniature imaging system for optical detection of chemical compounds and biological pathogens.





In collaboration with UC Santa Barbara, LLNL has developed advanced processing of GaN for laser diodes and high-power microwave devices.

Cone penetrometer, window assembly, and Raman probe were developed for characterizing contents of underground storage tanks at DOE's Hanford Site.



Raman probe and optics: The cigar-size optical configuration is common to both hand-held and cone penetrometer probes. The passive optical design allows for maintenance-free operation.

Hand-held Raman probe was designed for portable, on-site determination of chemical species found at spill sites or materials confiscated by law enforcement agencies.

Engineering
Lawrence Livermore National Laboratory
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